P-036

POLICE MODIFIER BULLETIN

SVE BULLETIN

SPECIAL VEHICLE ENGINEERING – BODY BUILDERS ADVISORY SERVICE

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FORD PRO - VEHICLE INTEGRATION SYSTEM 2.0
2024MY F-150 POLICE RESPONDER & 2025MY POLICE INTERCEPTOR UTILITY

REVISION	UPDATE	REVISION DATE
P-036	INITIAL RELEASE	11MAR2024

MODEL(S) AFFECTED:

- 2024MY and Beyond F-150 Police Responder
- 2025MY and Beyond Police Interceptor Utility

DESCRIPTION / OVERVIEW:

Introduced for the F-150 Police Responder and Police Interceptor Utility, the new Ford Pro Vehicle Integration System 2.0 allows for Upfitter(s) to install or operate vocational upfits. This hardware/software solution allows to seamlessly integrate equipment on the truck. Upfitters with a FIN code can sign in and begin using the Vehicle Integration System 2.0 software by click on this link: Ford Pro™ Login (b2clogin.com) .

The Vehicle Integration System 2.0 consists of a Vehicle Integration System 2.0 hardware module that allows upfitters to access the vehicle J1939 Control Area Network (CAN) signals of a Vehicle Integration System 2.0 equipped F-150 Police Responder and Police Interceptor Utility, and digitally connect the upfit to the vehicle. The upfitters can then use the cloud-connected Upfit Logic Editor to program physical switches, digital SYNC soft buttons, and alerts inside the cab. The common interface of the Vehicle Integration System 2.0 allows upfitters to deliver custom, consistent, and repeatable solutions to their customers.

Two-way communication between vehicle and the upfit becomes more streamlined and reliable. Peripheral devices – such as light bars, , sirens, etc. – can be directly connected and controlled from soft buttons within the Ford SYNC screens.** Vehicle Integration System 2.0 can be used to program dynamic interlocks that can help protect both equipment and crew.

(** Don't drive while distracted or while using handheld devices. Use voice-operated systems when possible. Some features may be locked out while the vehicle is in gear. Not all features are compatible with all phones.)

Vehicle Integration System 2.0 equipped F-150 Police Responder and Police Interceptor Utility come from the factory ready to be upfit. This means no incremental hardware solutions from aftermarket suppliers, no more splicing into factory wiring harnesses, and no more running out of switches inside the cab. Instead, Vehicle Integration System 2.0 allows you to reduce the need to stock hardware while greatly expanding functionality.

F-150 POLICE RESPONDER & POLICE INTERCEPTOR UTILITY – VEHICLE INTEGRATION SYSTEM 2.0 CONTENTS

Vehicles Built with Vehicle Integration System 2.0 Feature have the following functionality:

- Vehicle Integration System 2.0 is composed of: Pigtail Harness/Blunt Cut-Jumper, Vehicle Integration System 2.0 Module - J1939 Output Signals Access, and customer customizable Output/Input Signals.
- Programmability via the Ford Vehicle Integration System 2.0 Desktop Tool (https://www.fordpro.com/en-us/upfit/uis),
    - F-150 Police Responder will allow for customizable soft switches on the Sync screen.
    - Police Interceptor Utility allows for customizable steering wheel switches. (Sync soft switches not available at this time.)
- Vehicle Integration System 2.0 Module Pigtail Harness/Blunt Cut-Jumper Service Part Number: **PC3Z-14A303-A** (Ref. Engineering Part Number: PC3T-14A303-D*)

VEHICLE INTEGRATION SYSTEM 2.0 – INFORMATION & SUPPORT:

This UIS website https://www.fordpro.com/en-us/upfit/uis will provide information and support for fleet and upfitter communities with information about the Ford Vehicle Integration System 2.0. Below is a sampling of information that is available:

- ***Vehicle Integration System 2.0 Logic Software****:* Downloading the latest software version of the Ford Pro Vehicle Integration System 2.0to begin customizing your vehicles.
- ***Add VINs****:* Add VINs to deploy logic to vehicles. Once the VINs are added, the logic can be transferred to multiple vehicles.
- ***Quick Start Guide****:* Step-by-step guide to get you started with the logic software.
- ***Features & Signals****:* An overview of features, different input, and output signals on the Vehicle Integration System 2.0 (including CAN), and a summary of the different types of logic blocks available. *(J1939 CAN Read Signals, Logic Operators, SYNC Integration, and CAN write Signals)*
- ***Introductory Training****:* A detailed guide for getting started. This includes an overview of the logic tool functionality and examples illustrating the creation of logic.
- ***FAQs****:* Hardware/Software/Network Requirements, Vehicle Cable Connectivity, etc.

FORD PRO VEHICLE INTEGRATION SYSTEM 2.0 ACCESS:

To obtain access to the information shown above, the upfitter/final stage manufacturer will need to have a valid (approved) **Fleet Identification Number** (**FIN**) and username/password. **If you are experiencing website Log/Sign-In issues OR need to validate and/or have questions about your upfitter FIN code please contact the Ford Pro Contact Center of Excellence (Ford Pro CCoE) at 1-800-34-FLEET (1-800-343-5338), Select 'Option 2'.** This is a 24/7 Assistance Hotline.

If you do not have a valid FIN, please contact 1-800-34-FLEET (1-800-343-5338).

ELECTRICAL OVERVIEW:

IMPORTANT – F-150 Police Responder and Police Interceptor Utility have a new electrical architecture and includes CAN encryption. The new electrical architecture will no longer use the Gateway Module/OBDII connector, instead it will have a central gateway module connecting all the networks and provide channels via the standalone OBDII connector for diagnostic commands. CAN networks are no longer available from the OBDII connector.

VEHICLE INTEGRATION SYSTEM 2.0 MODULE - POWER ON/OFF STRATEGY:

Vehicle Integration System 2.0 Module is always powered during 'Key-On' and 'Accessory' modes – Module will be 'wakened' *in a maximum of 5 seconds* and/or 'asleep' in coordination with the vehicle network systems (approximately 5 – 10 minutes). In 'Key-Off' mode, the Module will not transmit any constant signal(s).

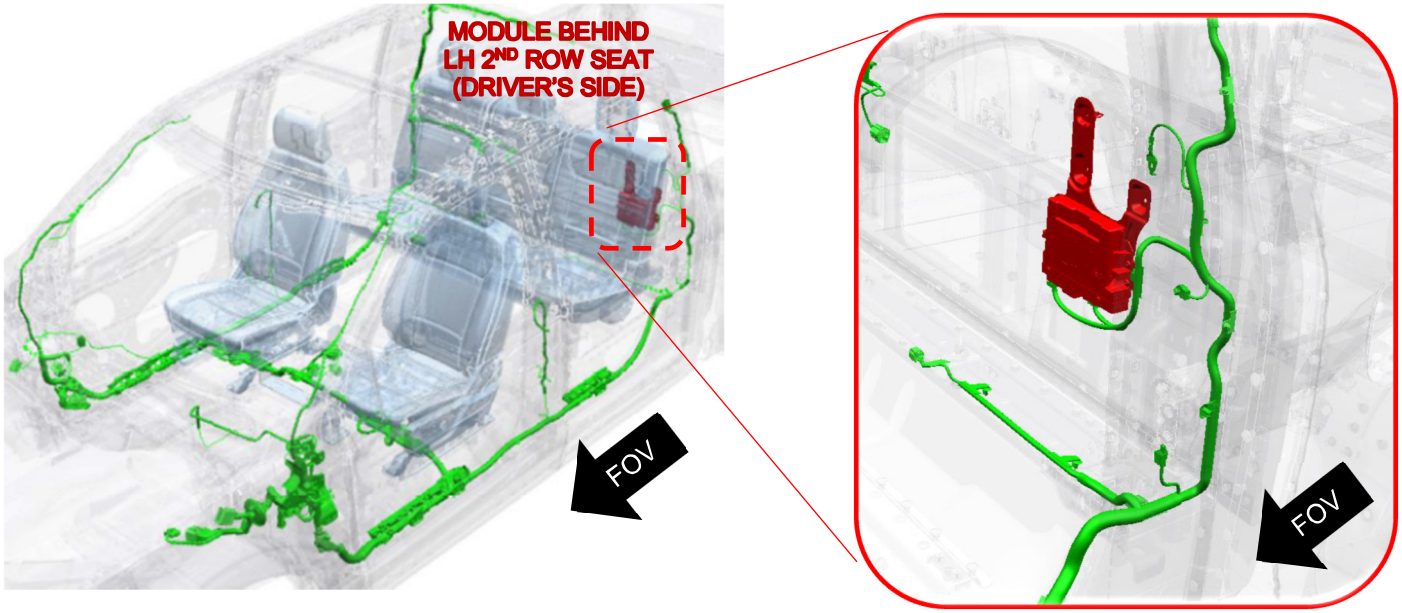
- WAKE FUNCTION: The 'wake' conditions are of two types:
    - a soft interruption (network management call from CAN) and
    - a circuit stimulation (any change of state inputs).
- ASLEEP FUNCTION: The trigger to go to sleep is based on the network management call from CAN network, this is dependent on conditions required for the module to sleep and/or 'Key-Off' mode.

VEHICLE INTEGRATION SYSTEM 2.0 MODULE - LOCATION: (Equipped From Factory)

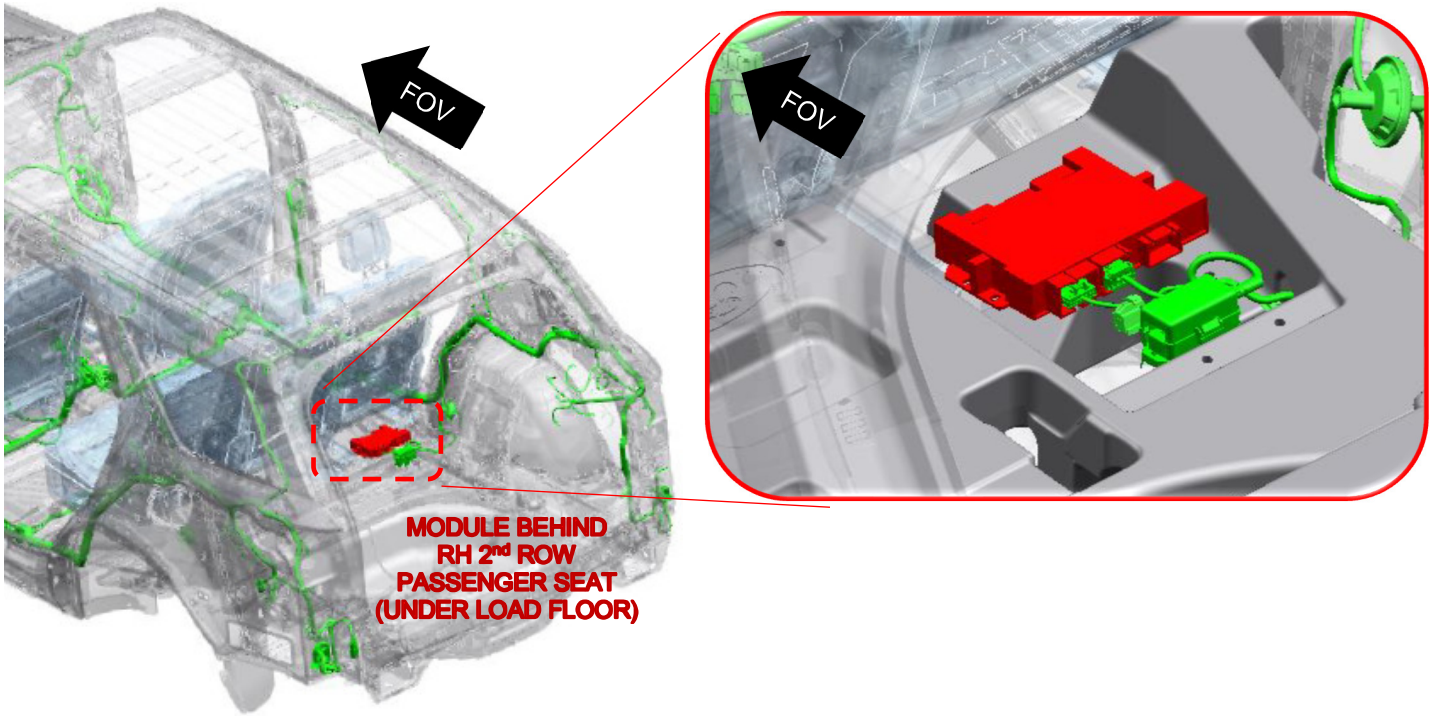
Reference the following images on the location of the Vehicle Integration System 2.0 Module for F-150 Police Responder and Police Interceptor Utility.

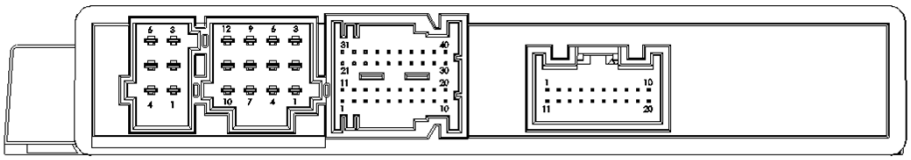
NOTE: Functionality will be provided via the Ford Provided pigtail harness/blunt cut-jumper.

F-150 POLICE REPONDER VEHICLE INTEGRATION SYSTEM 2.0 MODULE LOCATION



POLICE INTERCEPTOR UTILITY VEHICLE INTEGRATION SYSTEM 2.0 MODULE LOCATION





REFERENCE - VEHICLE INTEGRATION SYSTEM 2.0 MODULE CONNECTOR VIEW

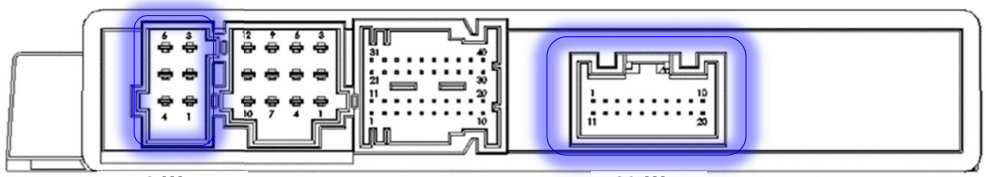
VEHICLE INTEGRATION SYSTEM 2.0 MODULE - J1939 OUTPUT SIGNALS:

Below is the list of currently available J1939.

ABS Active	Day	Vehicle Inhibit Motion
Ambient Air Temperature	Hours	Auxiliary Digital Input 1 Status
Air Conditioner Compressor	Minutes	Auxiliary Digital Input 2 Status
Accelerator Pedal Position	Seconds	Auxiliary Digital Input 3 Status
HVAC Recirculation Switch	Year	Auxiliary Digital Input 4 Status
Battery Current	Headlamp Low Switch Status	Auxiliary Digital Input 5 Status
Battery Voltage	Headlamp High Switch Status	Auxiliary Digital Input 6 Status
Battery Temperature	Headlamp Light Switch Status	Auxiliary Digital Input 7 Status
Brake Switch	Front Blower Speed	Auxiliary Digital Input 8 Status
Battery State Of Charge	Ignition Status	Auxiliary Digital Input 9 Status
Cruise Control Mode	Man Rgen Soot	Auxiliary Digital Input 10 Status
Day Running Light	Max Defroster Switch Status	Auxiliary Digital Input 11 Status
Door 1 Status	Odometer Master Value	Auxiliary Digital Input 12 Status
Hood Status	Oil Pressure Warning	Auxiliary Digital Input 13 Status
Door 2 Status	Perimeter Alarm Status	Auxiliary Digital Input 14 Status
Door 3 Status	Park Brake Switch Status	Auxiliary Digital Input 15 Status
Door 4 Status	Park Brake Status	Auxiliary Digital Input 16 Status
Door 5 Status	Park Light Headlamp Status	Auxiliary Digital Output 1 Status
MIL Lamp	Regenerative Braking Status	Auxiliary Digital Output 2 Status
Emergency Light Siren	Second Row Passenger Buckle Status	Auxiliary Digital Output 3 Status
Engine Status	Second Row Driver Buckle Status	Auxiliary Digital Output 4 Status
Engine Speed	Second Row Driver Middle Buckle Status	Auxiliary Digital Output 5 Status
Engine Coolant Temperature	Second Row Middle Buckle Status	Auxiliary Digital Output 6 Status
Engine Oil Temperature	Second Tow Passenger Middle Buckle Status	Auxiliary Digital Output 7 Status
Powertrain Status	Steering Wheel Angle	Auxiliary Digital Output 8 Status
First Row Driver Buckle Status	Stop Lamp Brake Request	Automatic Engine Idle Shutdown Override
First Row Passenger Buckle Status	Third Row Driver Buckle Status	Wheel Based Vehicle Speed
Front Fog Light Status	Third Row Middle Buckle Status	Vehicle Identification Number
Rear Fog Light Status	Third Row Passenger Buckle Status	Acceleration Rate
Fuel Level Percentage	Tire Pressure	Long Rate
Oil Transmission Temperature	Park System	Roll Rate
Neutral Gear	Left Turn Light Status	Vertical Rate
Current Gear	Right Turn Light Status	Yaw Rate
Select Gear	Hazard Light Switch Status	Front Wiper Switch Status
Four Auxiliary Steering Wheel Switches (Police Interceptor Utility ONLY)	Police Idle Status	

VEHICLE INTEGRATION SYSTEM 2.0 MODULE - J1939 OUTPUT CUSTOMER CAN-SIGNAL ACCESS:

MODULE CONNECTOR VIEW



6-Way ***20-Way***

1. Vehicle Integration System 2.0 Module Location: (Reference images on previous page)
   a. F-150 Police Responder – LH Behind 2nd Row Seat (Driver's Side)
   b. Police Interceptor Utility - RH Side, Behind 2nd row passenger seat (Under Load Floor)

2. Disconnect both the Black 20-Way and Blue 6-Way from the module to ensure no power is being delivered to module. (Reference respective Police Modifier Guides for circuits/pin-outs details.)

3. The Black 20-Way circuits will be used to access the J1939 signals. Focusing on the Black 20-Way connector, carefully begin to unravel/unwrap the flocked tape around the harness such that enough workable length is available to expose the wire circuits. Stow away the unraveled/unwrapped flock tape so it can be reused for re-installation later.

4. Locate the J1939 wired circuits 3 & 4 (wire 3 CAN ' **+** ' GN/BU & wire 4 CAN ' **–** ' GY/BU). These 2 circuits will be used in order to perform the cut and splice to obtain the signals.

   NOTE: The circuits remaining in the harness will not be used and no longer need to be connected. Recommend taping the circuits back securely and stowed away from the splice.

   NOTE: Follow the Ford approved procedure for soldering circuits to complete the splice. These are CAN network circuits that are a twisted pair, and for the added length ensure it meets the twists per foot requirement (4 twists per 50mm)

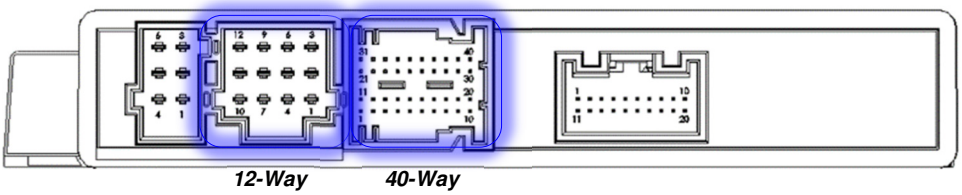
5. Complete the splice, following the Ford Repair Guidelines, rewrap the flock tape removed (Step 4) or use an acceptable substitute ensuring that circuits are wrapped within 50mm from the back of the connector.

6. Reconnect the Black 20-way, and Blue 6-way to the Module.

7. Reinstall the Vehicle Integration System 2.0 Module, and glove compartment following the reinstallation procedure outlined by Motorcraft Service, www.motorcraftservice.com .

VEHICLE INTEGRATION SYSTEM 2.0 MODULE - OUTPUT CUSTOMER CAN-SIGNAL ACCESS:

MODULE CONNECTOR VIEW



The following UIS sample list of Channel/Signal Outputs for the 40-Way and 12-Way.

40-WAY PINOUT (PU5T-14489 MA)

Cavity	Circuit	Color	Alt. Name	Signal Name	Description
1	CAC37A	YE/GN	LSD 1	MFA_15	LS Switch Output 0.5A, PWM
2	CAC39A	YE/VT	LSD 2	MFA_16	LS Switch Output 0.5A, PWM
3	CAC41A	GY/BN	LSD 3	MFA_13	LS Switch Output 1A, PWM
4	-	-	-	-	-
5	-	-	-	-	-
6	-	-	-	-	-
7	CAC20A	BU/GN	DAH 1	MFE_17	Digital Input, high active
8	CAC22A	GN/WH	DAH 2	MFE_19	Digital Input, high active
9	CAC24A	BU/GY	DAH 3	MFE_21	Digital Input, high active
10	CAC26A	GN/VT	DAH 4	MFE_23	Digital Input, high active
11	CAC43A	VT/GY	LSD 4	MFA_17	LS Switch Output 0.5A, PWM
12	CAC45A	WH/VT	LSD 5	MFA_18	LS Switch Output 0.5A, PWM
13	CAC47A	VT/OG	LSD 6	MFA_14	LS Switch Output 1A, PWM
14	-	-	-	-	-
15	-	-	-	-	-
16	-	-	-	-	-
17	CAC28A	BU/BN	DAH 5	MFE_18	Digital Input, high active
18	CAC30A	YE/BU	DAH 6	MFE_20	Digital Input, high active
19	CAC32A	GN/OG	DAH 7	MFE_22	Digital Input, high active
20	CAC34A	GN	DAH 8	MFE_24	Digital Input, high active
21	CAC54A	BN/GN	HSD 10	MFA_11	HS Switch Output 0.5A, PWM, Supply_2
22	CAC68A	BN/YE	HSD11	MFA_12	HS Switch Output 0.5A, PWM, Supply_2
23	CAC19A	BU	DAL 1	MFE_9	Digital Input, low active
24	CAC21A	GY	DAL 2	MFE_11	Digital Input, low active
25	CAC23A	GY/YE	DAL 3	MFE_13	Digital Input, low active
26	CAC25A	VT/WH	DAL 4	MFE_15	Digital Input, low active
27	VAC01A	WH/BN	ANL IN 1	MFE_1	Analog Input
28	VAC02A	GY/OG	ANL IN 2	MFE_3	Analog Input
29	VAC03A	WH/OG	ANL IN 3	MFE_5	Analog Input
30	VAC04A	YE	ANL IN 4	MFE_7	Analog Input
31	CAC69A	BU/GN	HSD 12	MFA_9	HS Switch Output 0.5A, PWM, Supply_1
32	CAC70A	VT/GN	HSD 13	MFA_10	HS Switch Output 0.5A, PWM, Supply_1
33	CAC27A	WH/GN	DAL 5	MFE_10	Digital Input, low active
34	CAC29A	GY/VT	DAL 6	MFE_12	Digital Input, low active
35	CAC31A	VT/BN	DAL 7	MFE_14	Digital Input, low active
36	CAC33A	GY/BU	DAL 8	MFE_16	Digital Input, low active
37	VAC05A	GN/BN	ANL IN 5	MFE_2	Analog Input
38	VAC06A	YE/VT	ANL IN 6	MFE_4	Analog Input
39	VAC07A	BN/BU	ANL IN 7	MFE_6	Analog Input
40	VAC08A	YE/OG	ANL IN 8	MFE_8	Analog Input

12-WAY PINOUT (PU5T-14489-LA)

Cavity	Circuit	Color		Signal Name	Description
1	CAC38A	BU/BN		MFA_7	HS Switch Output 5A, Supply_2
2	CAC40A	BN/GN		MFA_5	HS Switch Output 5A, Supply_1
3	CAC42A	WH/BN		MFA_6	HS Switch Output 5A, Supply_1
4	CAC44A	WH/OG		MFA_8	HS Switch Output 5A,Supply_2
5	CAC46A	GY/OG		MFA_4	HS Switch Output 10A, Supply_2
6	CAC48A	WH/GN		MFA_1	HS Switch Output 5A, Supply_1
7	CAC50A	VT/GN		MFA_3	HS Switch Output 5A, Supply_2
8	WAC64A	BU		MFA_20	HB_1 Output 5A, Supply_1
9	WAC65A	YE/GY		MFA_19	HB_1 Output 5A, Supply_1
10	WAC66A	VT/BN		MFA_22	HB_2 Output 5A, Supply_2
11	WAC67A	GN/VT		MFA_21	HB_2 Output 5A, Supply_2
12	CAC51A	BU/OG		MFA_2	HS Switch Output 10A, Supply_1

For every input into Vehicle Integration System 2.0 Module, the voltage range must be within the recommend minimum and maximum range, refer to the Ford Pro™ | Commercial Fleet Vehicles, Services & Telematics website, https://www.fordpro.com/en-us/upfit/uis .

For every Pulse Width Modulation (PWM), the maximum and minimum frequencies should be within the recommended high and low amperage outputs, refer to the Ford Pro website, https://www.fordpro.com/en-us/upfit/uis .

NOTE: UIS Grounding - recommendation is that the UIS must be grounded up to 40 Amps, and additional grounds to be routed/connected to chassis/frame. IT IS NOT RECOMMENDED TO UTILIZE EXISTING OEM GROUNDS, follow recommended grounding guidelines in General Body Builder Layout Book or www.motorcraftservice.com).

NOTE: During vehicle cranking and/or stop-start function, the voltage may drop below 9-Volts, 1. Vehicle Integration System 2.0 Feature will momentarily become interrupted (pause in functionality), until the voltage is recovered and Vehicle Integration System 2.0 Feature will resume.

Refer to the Body Builder Layout Book for additional guidelines and recommendations. If you have any questions, please contact the Ford Body Builders Advisory Service as shown in the header of this bulletin.